

Course on Actuarial Modelling in Non-Life Insurance

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Contents:

1. Basics of actuarial modelling
 - Basic definitions and concepts of actuarial modelling
 - Characteristics of a non-life insurer
 - The different risk categories in non-life insurance
 - Economical view on return and risk
 - Requests to the structure of the model
 - Advantages of a modular structure
 - Analytical versus simulative models
2. General concepts of models in non-life insurance
 - Requests to actuarial models in non-life insurance
 - Individual and collective model for the stochastic modelling of claims
 - Examples for models in non-life insurance
 - Models for corporate planning and valuation
3. Structure of an internal risk model (Case Study)
 - Modelling of gross premiums and costs
 - Stochastic modelling of gross claims, validation and plausibility checks
 - a. Modelling of attritional claims
 - b. Modelling of large claims
 - c. Modelling of catastrophes (natural catastrophes and catastrophes by accident or fire)
 - Reinsurance model (and different methods of technical pricing)
 - Modelling of reserving risk
 - Modelling of the development of claims over time
 - Modelling of dependency structures
 - Asset model and economic scenario generator
 - Management rules
 - Corporate Model
 - Internal models in a several year context
4. Applications of the internal model
 - Calculation of distribution functions, density functions
 - Calculation of ruin probabilities
 - Cost of Capital, Return on Risk Adjusted Capital, Economic Value Added, ...
 - Advantages and disadvantages of different risk measures (Value-at-Risk, Tail-Value-at-Risk, ...)
 - Advantages and disadvantages of different capital allocation methods in the context of a risk adjusted performance management
5. The iterative process of a risk adjusted performance management

The course is based on the book "Interne Unternehmensmodelle in der Schaden- und Unfallversicherung – Entwicklung eines stochastischen internen Modells für die wert- und risikoorientierte Unternehmenssteuerung und für die Anwendung im Rahmen von Solvency II" by D. Diers, which covers all important aspects of actuarial modelling in non-life insurance. After giving basic definitions and formulas the modelling process (actuarial control cycle) is shown in detail. The different steps of actuarial modelling, the components, structure and calibration of internal models are presented in a detailed case study using representative data and examples. At last the iterative process of a risk

adjusted performance management is discussed whereas the role of the internal risk model as an important basis of decision-making for the management becomes obvious.